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MANUFACTURES.

BROAD-SILK LOOM.

The SILVER MEDAL, and FIVE POUNDS, were presented to Mr. J. FARLEY, 2 Hart's Lane, Bethnal Green Road, for his Improvement in the Broad-Silk Loom; a Model of which has been placed in the Society's Repository.

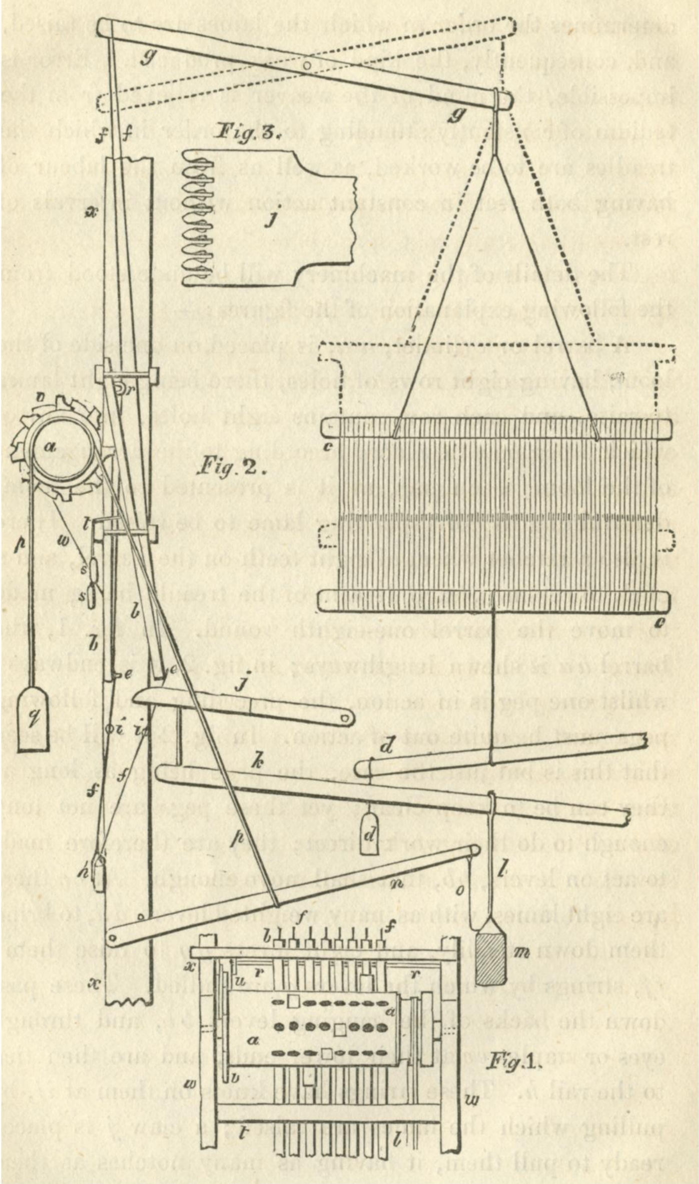
IN the broad-silk loom, adapted to weaving satins, serges, and small figures, eight treadles are required, and sometimes a greater number; the order in which these treadles are required to be worked, varies for each different kind of fabric, which is a constant tax on the memory, or rather on the attention, of the weaver; the perpetual motion of the feet proves very fatiguing, and the distance of some of the treadles obliges the weaver to bear with his breast on the loom, which is apt to bring on cough and serious disorders, more particularly if the weavers are women, as is often the case.

In Mr. Farley's machine, the eight levers which raise the lames, instead of being directly connected with and worked by the treadles, are attached to eight shafts vertically suspended, from the lower end of each of which proceeds a cord, with a knot in it; which cords are fastened below to one of the cross-bars of the machine. A broad paddle, or claw, with eight slits in it, is placed below the series of shafts, so that the knots of all the eight cords may be received in the corresponding slits. This claw is worked by a single treadle, so that the weaver may always have one foot at rest while the other is working.

But the knots of the shaft-cords are placed so, that when they hang perpendicular they are out of reach of the claw, and this is their natural situation; so that, unless some contrivance existed to bring up the knots within reach of the claw in an order of succession corresponding to the particular kind of work in hand, the treadle, though it would depress the claw, would want that connexion with the lames on which, alone, the proper action of the loom depends. This connexion is made in the following simple and ingenious manner:— Behind the shafts is placed a horizontal roller, at such a distance from the shafts as to revolve just without touching them; eight horizontal lines of holes, containing eight holes in each line, are placed, at equal distances, on the surface of the cylinder; movable pegs, or cams, are placed in these holes, one peg, or more, in each line, and these pegs project just enough to strike each shaft so far, that the knot of its cord shall be caught by the corresponding slit of the claw: and, therefore, when the claw is depressed by the action of the treadle, it shall carry down with it the cord, and the shaft connected with the cord, and, in doing so, shall depress the end of the horizontal lever to which it is attached, and, consequently, raise the lame suspended from the other end of the lever. Thus, the arrangement of the cams on the cylinder determines the order in which the lames are to be raised, and, consequently, the kind of work produced. Error is impossible, the mind of the weaver is relieved from the tedium of constantly attending to the order in which the treadles are to be worked, as well as from the labour of having both feet in constant action without intervals of rest.

The details of the machinery will be understood from the following explanation of the figures: —

A barrel or cylinder, *a a,* is placed on one side of the loom, having eight rows of holes, there being eight lames to raise, and each row contains eight holes, into any of which a peg may be placed according to the arrangement of the loom; each peg, as it is presented to the loom, determining its corresponding lame to be raised. There is also a ratchet wheel of eight teeth on the barrel, and a click to retain it, each descent of the treadle being made to move the barrel one-eighth round. In fig. 1, the barrel *a a* is shewn lengthways; in fig. 2, it is endways: whilst one peg is in action, the preceding and following pegs must be quite out of action. In fig. 2 it will be seen that this is but just the case, the pegs being as long as they can be to keep clear; yet these pegs are not long enough to do their work direct; they are therefore made to act on levers, *b b*, that shall move enough. At *c c* there are eight lames, with as many weighted levers, *d d*, to bring them down steadily, and eight levers *g g* to raise them; *ff*, strings by which the levers *g* are pulled. These pass down the backs of the hanging levers *b b*, and through eyes or staples *e e* at their lower ends, and are then tied to the rail *h*. These strings have knots on them at *i i*, by pulling which the lames are raised; a claw *j* is placed ready to pull them, it having as many notches as there


g
g
f f
Fig. 3.
j
x
r
v
a
c
Fig. 2.
l
w
p
s
s
b
b
e
e
j
q
i i
d
k
f
d
e
p
h
l
n
o
f
f
b
m
x
r
u
r
x
a
a
b
w
w
t
l
Fig. 1.

are strings (an under-view of the claw is shewn in fig. 3). This claw, which is kept up by a spring not here shewn, is tied to the lever *k*, and this lever is, by a string *l*, tied to the treadle *m*. Another lever *n* is tied by a slack string *o* to the treadle *m;* from this lever a cord *p* passes round the barrel *a* for the purpose of moving it, and ends in a weight *q:* one peg of the barrel always remains presented to the loom, and pushes its corresponding lever *b* in, and this holds its knot *i* within range of the claw.

When the weaver puts down the treadle *m*, it first pulls the lever *k*, and with it the claw *j*, to take hold of a knot *i;* the lever *n* then begins to move, and whilst the claw is raising a lame, the string *p* pulls round the barrel enough to present another peg. When the treadle *m* is released, the weight *q* slips its string and raises the lever *n;* a spring raises the claw *j* and treadle *m*, and the rounded top of the claw easily passes the knot, which has been pushed in ready for the next pull; and so on in succession. The levers *b b* hang on the rod *r*, and are not left to fall back merely by their own weight when their pegs leave them, but have either springs or weights. In fig. 2, weights *s s* are shewn hanging over the rail *t*, which pulls them back; *v* is the ratchet wheel: *u*, fig. 1, shews part of the click hanging on the rod *r;* *w w* are the brackets in which the barrel *a* is mounted; *x x* one post of the loom.